REMARKS

With entry of the present amendment, the application will contain claims 1-7.

Double Patenting

The rejection in the last Office Action of claim 8 is traversed, but has been rendered moot by the cancellation of this claim.

Rejections under 35 U.S.C. § 102

The rejection on page 3 of the Office Action of claims 1-5 and 7 as lacking novelty under 35 U.S.C. § 102 over U.S. Patent 6,294,260 (Subramanian) is traversed.

For reasons explained more fully below, the pending claims do not describe the subject matter disclosed by Subramanian.

The rejection of claims 1, 2 and 7 on page 4 of the Office Action as anticipated under 35 U.S.C. § 102 in view of U.S. Patent 6,177,200 (Maloney) is traversed

For reasons explained more fully below, Maloney does not disclose the claimed subject matter.

Rejections under 35 U.S.C. § 103

The rejection on page 4 of the Office Action of claims 1-3 and 5-7 as obvious under 35 U.S.C. § 103 over U.S. Patent 6,387,526 (Beele) in view of U.S. Patent 5,514,482 (Strangman) is traversed.

As explained more fully below, it would not be obvious to combine the teachings of Beele and Strangman and, even if the teachings were combined, the result would still not be subject matter within the scope of that claimed.

The rejection on page 5 of the Office Action of claims 1 and 5-7 as obvious under 35 U.S.C. § 103 over U.S. Patent 6,440,575 (Heimberg) in view of Strangman is traversed.

As explained more fully below, it would not be obvious to combine the references in the manner suggested by the Examiner. Even if it were obvious to combine the references, the result would still not be subject matter within the scope of that claimed.

The present invention relates to a heat-resistant coated member for use when sintering or heat-treating metals or ceramics in a vacuum, an inert atmosphere or a reducing atmosphere.

More specifically, the invention provides the heat-resistant coated member having the above-described specific substrate and the coating thereon, a coating layer composed of the lanthanoid-containing oxide as the film oxide.

As proved in Examples 1, 2, 4, 5, 7, 8, 10 and 11 and Comparative Example 1 of the specification, the coated member of

the invention has a good heat resistance as well as a good corrosion resistance and non-reactivity.

Subramanian relates to multiphase ceramic thermal barrier coatings for high temperature application for coating superalloy components of a combustion turbine.

The Subramanian ceramic oxide overlay precursor material has a base structure of $(A,B)_xO_y$, where A and B may be rare earth elements and the substrate is a superalloy as described in column 4, lines 17-23:

> The blade itself can be made from a high temperature resistant nickel or cobalt based superalloy, such as a combination of Ni.Cr.Al.Co.Ta.Mo.W, or more specifically a composition of, for example, by weight, 10% Co, 8.4% Cr, 0.65% Mo, 10% W, 3.3% Ta, 1.05% Ti, 5.5% Al, and 1.4% Hf, with minor amounts of Zr, C, and B in a Ni matrix (commercially known as "MAR-M247 alloy").

Thus, Subramanian discloses only the substrate made of Ni- or Co-base superalloy containing Ta, Mo or W as a part of the alloy.

Maloney discloses a metallic article comprising a metallic substrate having a ceramic thermal barrier coating on its surface wherein the ceramic thermal barrier coating is composed of gadolinia and zirconia and has a cubic crystal structure. Maloney states in column 3, lines 41-49:

> The invention coating materials and coatings will usually be used to protect a superalloy substrate from excess temperatures. Superalloys are metals, usually based on iron, nickel or cobalt and containing chromium and aluminum and usually including titanium and refractory metals, and having useful properties above 1200°F. (650°C). Other substrates, including steels, copper

> alloys and titanium alloys may be protected. Table I describes exemplary substrate materials.

Thus, Maloney discloses only the substrate of the Fe-, Ni- or Co-base superalloy which may contain Ti.

However, the present invention excludes the use of metals such as Fe, Ni, Co described in Subramanian and Maloney for the substrate. The invention is directed to the single use of Mo, Ta, W, Zr or Ti, or alloys composed only of these metals for the substrate. These metals have a purity of 99 wt% or more, and contain only inevitable impurities.

Beele provides a ceramic-coated product, in particular a ceramic coated component for use in a hot gas duct, especially in industrial gas turbines. Beele discloses:

> ...the product is preferably a component of a heat engine, for example a gas turbine blade,... Such gas turbine components, e.g., turbine blades or heat shields, preferably have a base body which is formed of a superalloy based on nickel, chromium or iron (column 3, lines 59-66).

Strangman relates to a thermal barrier coating for superalloy components. It discloses in column 2, line 63 to column 3, line 7:

> My present invention involves a thermal barrier coated turbine component which include two inter-related layers on the superalloy substrate. The base metal or substrate of my present invention may be nickel, cobalt or iron base high temperature alloys used for turbine airfoil applications, i.e., blades or vanes. My present invention is particularly applicable to hafnium and/or zirconium containing superalloys such as MAR-M247, IN-100 and MAR-M509, the compositions of which are shown in Table I.

Heimberg provides a product having a metallic base body and a ceramic thermal barrier layer bonded thereon, in particular with a mixed metal oxide system. A base body may be made of a nickel-based/cobalt-based or chromium-based superalloy (column 7, lines 3-4).

As described above, the cited references use the superalloys such as Fe-, Co-, or a Ni-base alloy for the substrate. These superalloys may contain one or more metals of Mo, W, Ta, Ti and Zr.

However, the cited references fail to teach or suggest the single use of Mo, Ta, W, Zr or Ti, or alloys thereof for the substrate as disclosed in the present invention.

These metals have higher melting points and are referred as refractory metals. Although they can serve as a heat-resistant member as they are, the inventors have found that heat-resistant coated members made of a substrate composed of one of such metals or alloys thereof and a layer which covers the substrate and is composed of a lanthanoid-containing oxide have improved heat resistance and can be effectively used for sintering or heat-treating metals or ceramics in a vacuum, an inert atmosphere or a reducing atmosphere.

The cited references completely fail to teach or suggest the use of the specific substrate for the coated member and the features thereof.

Accordingly, the present invention is neither disclosed nor obvious over the cited references.

CONCLUSION

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact David R. Murphy (Reg. No. 22,751) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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